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(54) **COLLECTION OF INTRANET ACTIVITY DATA**

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USPC 707/661–694
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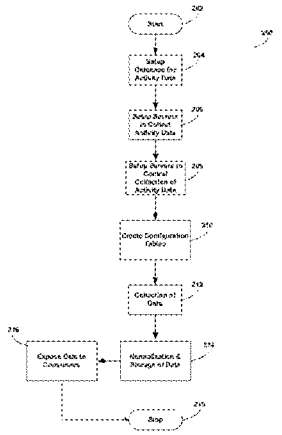
(57) **ABSTRACT**

Systems, methods and computer program products for facilitating the collection of data within a computer network (especially an intranet) while complying with applicable privacy laws and regulations, as well as individual organizations' rules addressing intranet users' privacy are disclosed. Such systems, methods and computer program products allow for the collecting of activity information related to computer-based activities performed by users while logged into an organization's intranet. Such activity includes navigating to URLs, opening and editing documents, writing, opening and reading email and instant messages, and the like. The collecting, consolidating, storing and exposing of such activity information—while ensuring privacy requirements—serves as a basis for high-value services (e.g., augmenting documents with extra information, improving search results, automatic news feeds, social networking announcements, etc.) to be offered and provisioned to such users.

15 Claims, 6 Drawing Sheets



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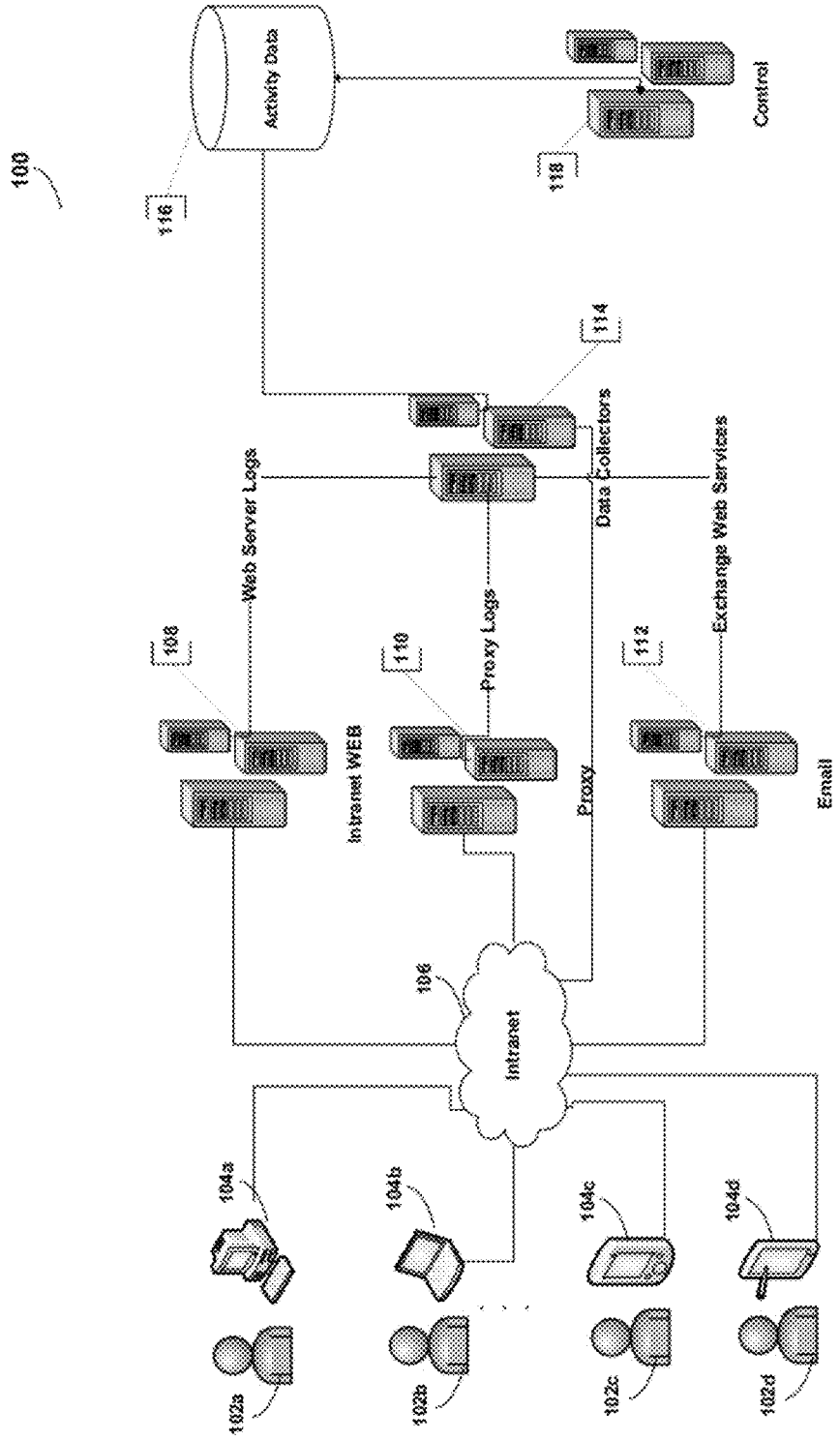
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Control
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Exchange Web Services
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104a
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102d

FIG. 1

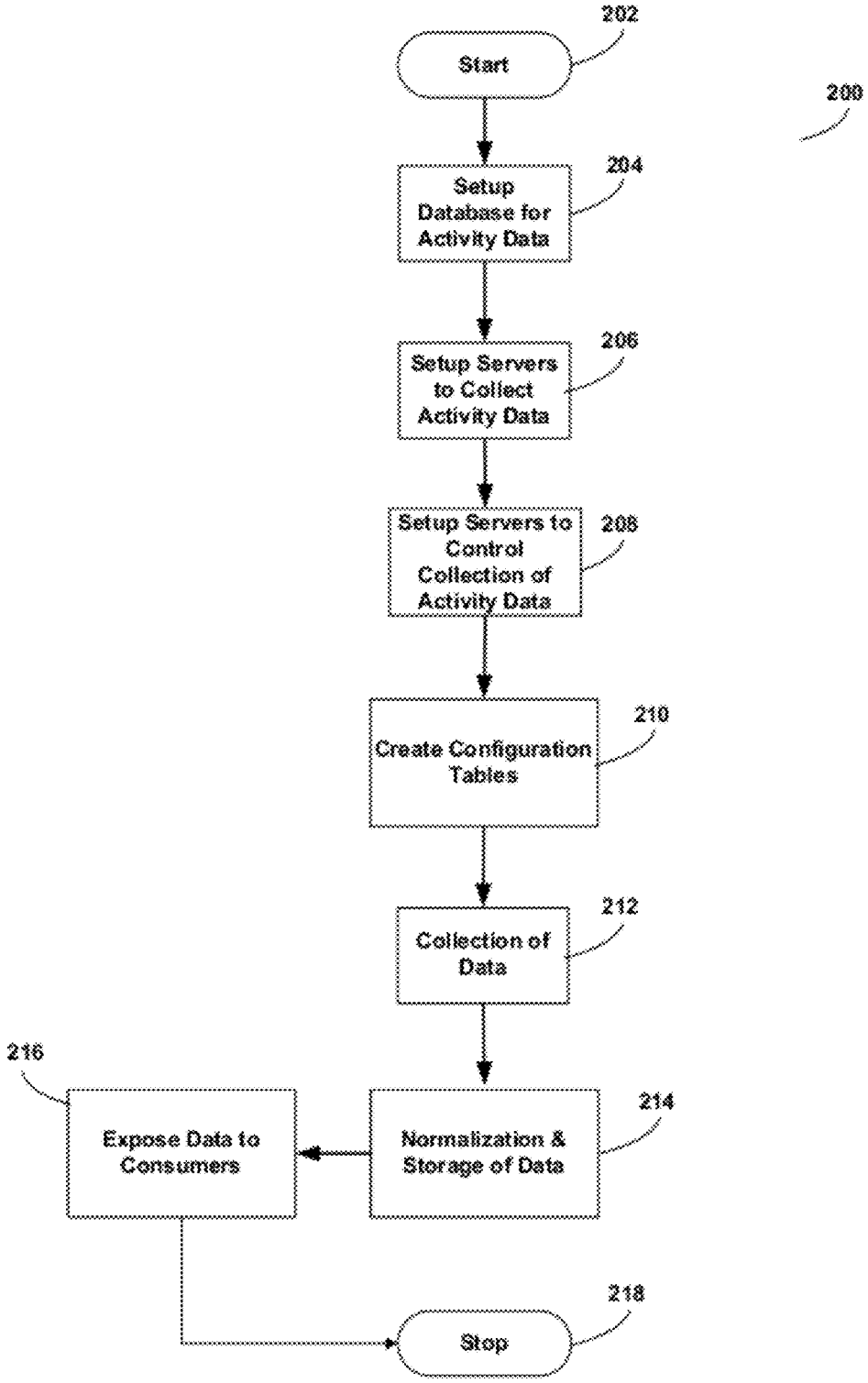

200
202
Start
204
Setup Database for Activity Data
206
Setup Servers to Collect Activity Data
208
Setup Servers to Control Collection of Activity Data
210
Create Configuration Tables
212
Collection of Data
214
Normalization & Storage of Data
216
Expose Data to Consumers
218
Stop

FIG. 2

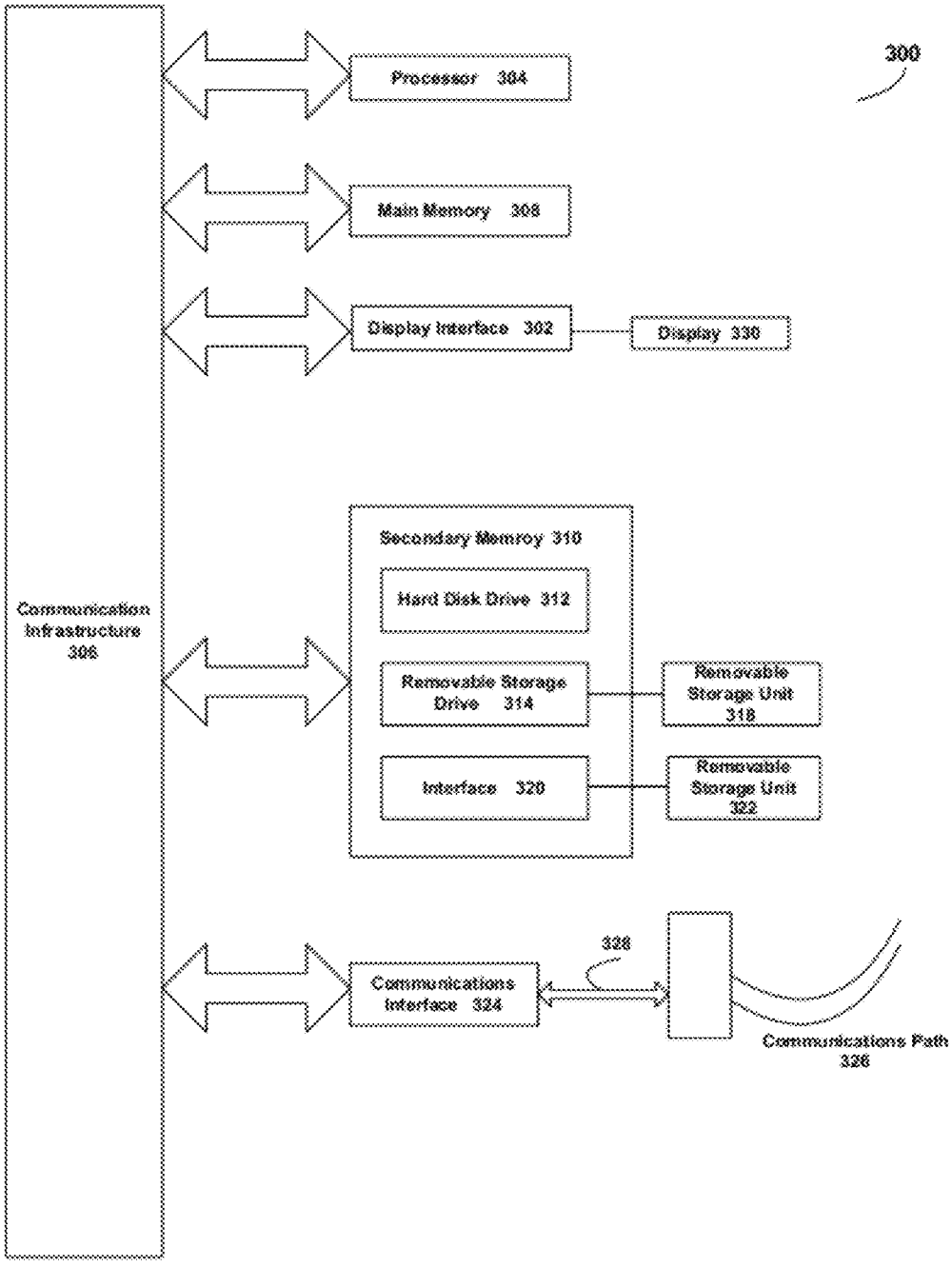
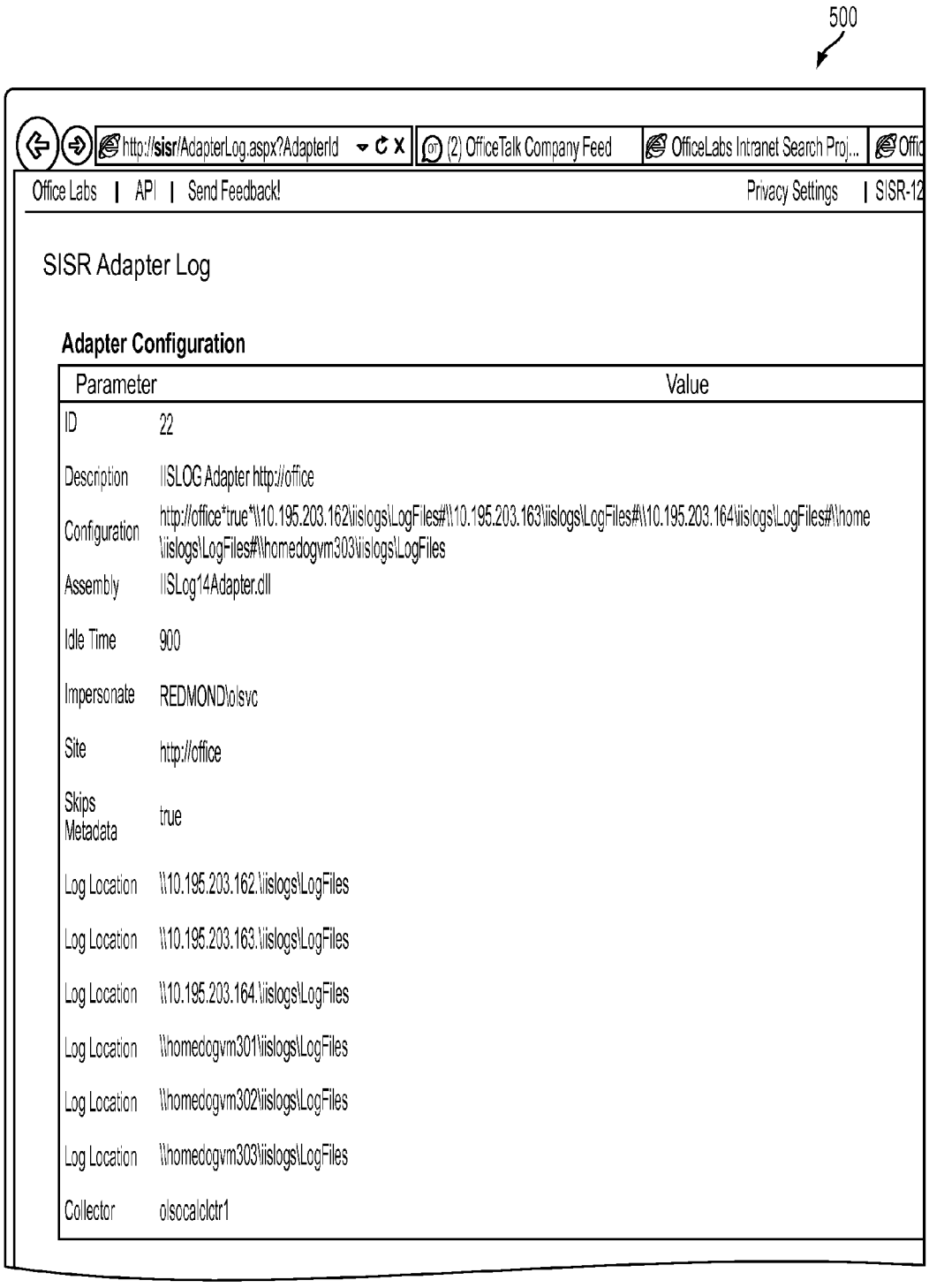

300
Processor 304
Main Memory 306
Display Interface 302
Display 330
Secondary Memroy 310
Hard Disk Drive 312
Removable Storage Drive 314
Removable Storage Unit 318
Interface 320
Removable Storage Unit 322
Communication Infrastructure 306
328
Communications Interface 324
Communications Path 326

FIG. 3

400

AdapterId	Description	ConfigData	AssemblyName	IdleTime	Impersonate_Account	DayOfWeek	HourOfDay
1	Active Directory Collector	GC://company.com	ActiveDirectoryOMAdapter.dll	360	NULL	6	1
2	Company SharePointWSCL Collector	http://company#false	SharePoint14WSCLAdapter.dll	120	NULL	NULL	NULL
3	Company SharePoint IISLog	http://company#true#\\Server\logs#\\OtherServer\logs	IISLog14Adapter.dll	180	NULL	NULL	NULL
4	Distribution Lists Mail Adapter	forceFullCrawl=false	DLMailAdapter.dll	300	SomeDomain\ServiceAccount	NULL	NULL
5	Company Other SharePoint IISLog	http://company#false#\\YetAnotherServer\logs	IISLog14Adapter.dll	360	NULL	NULL	NULL

FIG. 4



TO FIG. 5B

FIG. 5A

FROM FIG. 5A

Adapter Log

Created	Context	Message
3/11/2011 2:21:51 AM	Adapter	Adapter exited. Reason: 'OK'
3/11/2011 2:21:51 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1439681206	Processed 0 files in folder '\\homedogvm302\iislogs\LogFiles/W3SVC1439681206'. Processing at '3/11/2011 2:21:50 AM' taking 00:00:00.0781240. Parsed 0 rows and added 0 activities.
3/11/2011 2:21:51 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1439681206 \u_ex110310.log	Succeeded processing file '\\homedogvm302\iislogs\LogFiles/W3SVC1439681206\u_ex110310. completed on '3/11/2011 2:21:50 AM' taking 00:00:00.0781240. Processed 0 rows with 0 activities.
3/11/2011 2:21:50 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1439681206	Folder has '1' files, last updated '3/10/2011 10:06:11 PM' UTC.
3/11/2011 2:21:50 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1 \u_ex110310.log	Succeeded processing file '\\homedogvm302\iislogs\LogFiles/W3SVC1\u_ex110310.log' which on '3/11/2011 2:21:50 AM' taking 00:00:00.0156248. Processed 0 rows with 0 activities created.
3/11/2011 2:21:50 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1	Processed 0 files in folder '\\homedogvm302\iislogs\LogFiles/W3SVC1'. Processing started at '3/11/2011 2:21:50 AM' taking 00:00:00.0156248. Parsed 0 rows and added 0 activities.
3/11/2011 2:21:50 AM	\\homedogvm302 \iislogs\LogFiles\W3SVC1	Folder has '1' files, last updated '3/10/2011 4:48:32 PM' UTC.
3/11/2011 2:21:50 AM	\\homedogvm301 \iislogs\LogFiles\W3SVC1439681206 \u_ex110310.log	Succeeded processing file '\\homedogvm301\iislogs\LogFiles/W3SVC1439681206'\u_ex110310. completed on '3/11/2011 2:21:50 AM' taking 00:00:00.0624992. Processed 0 rows with 0 activities.
3/11/2011 2:21:50 AM	\\homedogvm301 \iislogs\LogFiles\W3SVC1439681206	Processed 0 files in folder '\\homedogvm301\iislogs\LogFiles/W3SVC1439681206'. Processing at '3/11/2011 2:21:50 AM' taking 00:00:00.0624992. Parsed 0 rows and added 0 activities.
3/11/2011		

FIG. 5B

COLLECTION OF INTRANET ACTIVITY DATA

CROSS REFERENCE TO RELATED APPLICATIONS

This application is related to co-pending: U.S. patent application Ser. No. 12/773,319, titled "Presentation of Information Describing User Activities With Regards To Resources," filed on May 4, 2010; U.S. patent application Ser. No. 12/771,290, titled "Prioritization of Resources Based On User Activities," filed on Apr. 30, 2010; U.S. patent application Ser. No. 13/106,307, titled "Automatic Social Graph Calculation," filed concurrently herewith; and U.S. patent application Ser. No. 13/106,149, titled "Personalized News Feed Based on Peer and Personal Activity," filed concurrently herewith; each of which is hereby incorporated by reference as to its entire contents.

FIELD OF THE INVENTION

The present invention generally relates to computer networks and more particularly to systems, methods and computer program products for facilitating the collection of data within such networks.

BACKGROUND

In today's technological environment, it is common for business enterprises and other organizations to deploy private computer networks—intranets—to securely share such organization's information or network operating systems within that organization. The term "intranet" is used in contrast to "internet", which is a network between organizations, the most common of which is the global, public Internet. That is, an intranet is a network within an organization which sometimes refers only to the organization's internal (private) website, but may be a more extensive part of the organization's information technology (IT) infrastructure. It may host multiple private websites and constitute an important component and focal point of internal communication with, and collaboration among, individual computer users associated/affiliated with the organization (e.g., students within a university, co-workers within a company or local, state or federal government department or agency, co-workers within a charitable or any other type of organization).

As individual computer users associated/affiliated with the organization perform various computer-based activities while logged into the organization's intranet, there are a constant stream of activities occurring such as navigating to URLs, opening and editing documents, writing, opening and reading email messages, and the like. Information about these activities can be very useful (e.g., augmenting documents with extra information, improving search results, creating automatic news feeds, sending social networking announcements, etc.). Normally, however, such information is not collected within intranets and is lost. Yet, collecting, consolidating, storing and exposing activity information while ensuring privacy requirements allows for a number of high-value services to be built and offered based on such information.

Should such information be collected, there is one concern that must be addressed—privacy. That is, protecting personal privacy is more complex in the information age. As more and more business is transacted "online," the volume of personal information available on computer networks

continues to grow. Thus, individuals using these computer networks are demanding greater control over how their personal information is stored, used and shared. Also, organizations are seeking better ways to manage and safeguard the sensitive personal data in their custody. In response, many governments on the national (e.g., federal), state, and local level, have passed laws dealing with individuals' privacy—especially concerning Personally Identifiable Information (PII) which is any information that identifies or can be used to identify, contact, or locate the person to whom such information pertains, or from which identification or contact information of an individual person can be derived. More specifically, PII includes names, addresses, and phone numbers as the more obvious examples. Email addresses and IP addresses may also be included in this category. An emerging category of such information includes geo-location information that allows the sharing of the physical location of the user, a feature that is becoming popular in location-based services and social networking scenarios.

Sensitive PII includes financial profiles, health profiles, national ID numbers, social security numbers, credit card information, and other information designated as such by legislation (e.g., race, ethnicity, political opinions, religious or philosophical beliefs, trade-union membership, sex life, etc.). Collecting sensitive PII data may bring enhanced exposure to legal, regulatory, and political risks and requires additional safeguards for data security, integrity and notice.

Collective information is a more subtle issue for privacy issue spotting because a single piece of information such as website usage would seem relatively benign and by itself would not be PII. However, data collected over time for online behavior such as search, web surfing, and social networking habits may eventually allow the user's identity to be discovered using data mining and correlation methods.

Privacy concerns are exacerbated in the context of private networks such as intranets. This is because use of these private networks requires users to log in with a "user id" and password assigned by the owner of the network (e.g., the user's employer). This destroys the anonymity provided by other networks such as the Internet.

Given the foregoing, what are needed are systems, methods and computer program products for facilitating the collection of data within a computer network (especially an intranet) to allow for the provisioning of high-value services while complying with applicable privacy laws and regulations, as well as individual organizations' rules and policies addressing intranet users' privacy.

SUMMARY

This summary is provided to introduce a selection of concepts. These concepts are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is this summary intended as an aid in determining the scope of the claimed subject matter.

The present invention meets the above-identified needs by providing systems, methods and computer program products for facilitating the collection, consolidating, storing and exposing of data within a computer network (especially an intranet) to allow for the provisioning of high-value services while complying with all applicable privacy laws and regulations (i.e., all national and local privacy laws and regulations that are applicable given the one or more jurisdictions in which the computer network traverses), as well as individual organizations' rules/policies addressing their intranet users' privacy.

In an embodiment, a set of configurable data collectors which are operating on variety of existing data sources within an intranet, such as web content management log files, document management log files, web server log files, proxy server log files, directory service information, email servers, and the like, are combined with a local or cloud based-storage, and configuration, status and retrieval services to transform, aggregate and anonymize collected information as needed for the provisioning of high-value services, and as required by all applicable privacy laws or organizational policies.

Further features and advantages of the present invention, as well as the structure and operation of various embodiments of the present invention, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention will become more apparent from the detailed description set forth below when taken in conjunction with the drawings in which like reference numbers indicate identical or functionally similar elements.

FIG. **1** is a block diagram illustrating an exemplary intranet activity data collection system according to an embodiment of the present invention.

FIG. **2** is a flowchart illustrating an exemplary intranet activity data collection process according to an embodiment of the present invention.

FIG. **3** is a block diagram of an exemplary computer system useful for implementing the present invention.

FIG. **4** is an exemplary activity data collection configuration table according to an embodiment of the present invention.

FIG. **5** is a screenshot illustrating an exemplary graphical user interface window for the management of activity data collection and consumption according to an embodiment of the present invention.

DETAILED DESCRIPTION

The present invention is directed to systems, methods and computer program products for facilitating the collection, consolidating, storing and exposing of data within a computer network (especially an intranet) to allow for the provisioning of high-value services while complying with all applicable privacy laws and regulations, as well as individual organizations' rules/policies addressing their intranet users' privacy. In various embodiments, such high-value services offered to the intranet's users include augmenting documents with extra information, improving search results, creating automatic news feeds, creating social networking announcements, and/or the like.

Referring to FIG. **1**, a block diagram illustrating an exemplary intranet activity data collection system **100**, according to an embodiment of the present invention, is shown.

Intranet activity data collection system **100** includes a plurality of users **102** (shown as users **102***a-d* in FIG. **1**) accessing, via a computing device **104** (shown as devices **104***a-d* in FIG. **1**), an organization's intranet (i.e., private network) **106**. As will be appreciated by those skilled in the relevant art(s) after reading the description herein, intranet **106** may be a private network deployed by an organization such as a business enterprise for use by its employees, deployed by a university for use by its students and faculty, deployed by a government agency for its workers, and the like. As will also be appreciated by those skilled in the relevant art(s) after reading the description herein, system **100** may be deployed across one or more jurisdictions as, for example, a multinational business enterprise makes its intranet **106** available to its employees around the world. This would thus subject system **100** to a plurality of national, state and/or local privacy laws and regulations that are applicable in such one or more jurisdictions in which intranet **106** spans.

In various embodiments, device **104** may be configured as a desktop **104***a*, a laptop **104***b*, a PDA **104***c*, a tablet or mobile computer **104***d*, an intelligent communications device or the like.

As users **102** log into intranet **106**, they perform various computer-based tasks while logged into the organization's intranet. Thus, there are constant streams of activities occurring such as navigating to URLs, opening and editing documents, writing, opening and reading email and/or instant messages, and the like. System **100** thus further includes one or more data collection servers **114** which perform the importing and processing of raw (user **102**) activity data from various sources within system **100**. In an embodiment, such sources of raw activity data include log files from one or more intranet web servers **108**, one or more proxy servers **110**, and one or more email servers **112**. In alternate embodiments, data collection servers **114** may receive raw activity data directly (via intranet **106**) from one or more client-side activity collection applications executing in the background on any of devices **104**.

In an alternative embodiment of the present invention, each collection server **114** can host one or more activity data collection rules (or "adapters") which are designed to retrieve data from a specific data source (e.g., web server **108**, proxy server **110**, email server **110**, a client-side logging application executing on device **104**, and/or the like). In such an embodiment, all adapters share a common collector infrastructure which includes one or more of the following:

1. Logging services which allow for monitoring and troubleshooting of a specific adapter.
2. Software watch-dog service which terminates and restarts collection should it stop progressing for whatever reason.
3. State service which allows for terminating and resuming collection at any moment for whatever reason such as maintenance or network failure without need to run complete collection again.
4. Data normalization services which allow for presenting activity subject (e.g., which URL a user **102** clicked on) in non-ambiguous way.
5. Data filtering services which allows only desired information to be stored in data storage **116** in an effort to reduce total required storage space.
6. Policy enforcing services which implements a set of rules in accordance with privacy laws and/or organizational rules at any stage of the process (collection, aggregation, access, etc.).

In alternate embodiments, other sources of activity data within system **100** may include directory service information, web content management log files, document management log files (e.g., high business impact, web server log files, proxy server log files, email distribution lists or news groups, instant messages, text messages, telephone calls, and the like).

System **100** also includes a data storage **116**, which can be local (e.g., an on-site database such as one or more SQL servers) or cloud based (e.g., the SQL Azure™ storage platform available from Microsoft Corporation of Redmond,

Wash.), which stores the data collected by servers **114** in a unified format. In an alternate embodiment, data stored within database **116** (and the network connections thereto) may be encrypted to ensure compliance with privacy laws and organizational rules.

In an embodiment, system **100** includes one or more control servers **118** that are used for configuration, status and data retrieval control. That is, control servers **118** monitor the collection of activity data as well as allow the data to be consumed for the provisioning of high-value services (not shown in FIG. **1**) as permitted by any applicable privacy laws and organizational rules.

In an alternate embodiment, control servers **118** may employ a web interface (e.g., the SharePoint® web platform available from Microsoft Corporation of Redmond, Wash.) to allow intranet administrators to configure and monitor data collection and data consumption. For example, such a web platform can be used as a base and can allow for complete configuration and monitoring of system **100** such as the location of log files, access credentials, privacy and organizational rules, data filtering and the like as shown in screenshot **500** of FIG. **5**.

In an alternate embodiment, an intranet administrator would have access to control servers **118** via a web service-based application programming interface (API) (e.g., Simple Object Access Protocol (SOAP) or RESTful). In such an embodiment, the intranet administrator may enforce privacy laws and organizational rules based on access credentials. For example, an unprivileged user might be allowed to retrieve the total number specific documents being accessed within intranet **106**, while an authorized user can retrieve more detailed information such as which user **102** accessed certain documents and when. This allows privacy protection while storing complete and detailed information as permitted by applicable privacy laws and organizational rules.

In various embodiments, control servers **118** allow for built-in support for enforcing privacy laws and organizational rules, including facilities for the following:

1. Access rules which define who can access the data and in which way (e.g., detailed versus anonimzed).
2. Exclusion rules which define groups of users **102** or data sources from which collection should not be performed. For example, users **102** from the organization's legal department, C-level executives and the like can be excluded from collection to protect privileged/sensitive information. Or, users from particular geographical location can be excluded if privacy laws at that location prohibit or restrict activity collection. Sites which are considered "high business impact" can be also excluded (e.g., based on data automatically collected from directory service information or web content management application servers).
3. Aggregation and/or transformation rules which may aggregate data from certain sites where privacy laws or organizational policies permit collection of data in anonimized, aggregated form. These rules can apply during both collection of the data, as well as while exposing of the data (e.g., based on access rules).
4. Consent rules which allows users **102** to have notice of the data collection within system **100** and choose whether to participate. Consent may take several forms: Opt-in consent where user **102** has to take an affirmative action before data is collected; or Opt-out consent where user **102** can take an affirmative action to prevent the collection of data before that data is collected.

Referring to FIG. **2**, a flowchart illustrating an intranet data collection process **200**, according to an embodiment of the present invention, is shown. Process **200**, which would execute within system **100**, begins at step **202** with control passing immediately to step **204**.

In step **204**, database **116** is setup and deployed within system **100** (locally or cloud-based) to store all intranet **106** activity data collected by process **200**.

In step **206**, one or more data collection servers **114** are deployed within system **100** to access and collect activity data from data sources within intranet **106**—such as web servers **108**, proxy servers **110**, email servers **112**, and client-side logging applications running on one or more devices **104**, and to eventually store the collected activity data into database **116**.

In step **208**, one or more control servers **118** are deployed within system **100** to control data collection from intranet **106** and expose the collected data to various consumers implementing high-value services.

In step **210**, one or more configuration tables are created within control servers **118** to specify the activity data to be collected by collection servers **114**. That is, the configuration table, in an embodiment, reflects the access rules, aggregation and/or transformation rules, exclusion rules, and consent rules specified by the administrator of intranet **106** reflecting the one or more applicable jurisdictions' privacy laws or regulations and the one or more of the organization's policies.

In step **212**, process **200** begins to collect activity data in accordance with the one or more configuration tables loaded onto control servers **118** by, for example, an intranet administrator.

In step **214**, the activity data collected by collection servers **114** are normalized and then stored in database **116**. In an embodiment, data normalization **214** occurs in process **200** based on item meaning. For example, if a user **102** opens a spreadsheet document, action is taken on that document no matter how it was opened (e.g., saved to the disk from a website, opened from a spreadsheet application directly or opened from a spreadsheet application web viewer). All these cases might result in different URLs, while they all represent the same document (and thus should all reflect the same activity data). Thus, in such an embodiment, the normalization process **214** may first detect the fact that the document was opened via a web viewer, and then extracts the file location. In such a case, activity data would be recorded by process **200** based on the document location as opposed to being based on the original URL.

In an alternate embodiment, data normalization **214** occurs in process **200** based upon canonical URL representations. In such an embodiment, data normalization resolves textually different URLs that are logically equivalent into one URL for data integrity purposes. This involves disassembling a URL and then reconstructing it such that the resulting URL has a unified format, same escape sequences and/or encoding, same query string parameter order and the like.

In step **216**, collected data is exposed to consumers (i.e., applications and/or servers not shown in FIG. **1**) providing high-value services as determined by the rules set in step **210**.

Process **200** then terminates as indicated by step **218**.

As will be appreciated by those skilled in the relevant art(s) after reading the description herein, in various embodiments, steps **212-216** may be repeated according to one or more pre-determined time schedules based upon the requirements of one or more high-value services built and offered to users **102** based on such information (e.g., augmenting

documents with extra information, improving search results, automatic news feeds, social networking announcements, etc.).

As will also be appreciated by those skilled in the relevant art(s) after reading the description herein, step **210** may be repeated anytime the intranet administrator needs to update the one or more configuration tables to specify the activity data collected by updating one or more access rules, aggregation and/or transformation rules, exclusion rules, consent rules in response to: a change in one or more applicable jurisdictions' privacy laws or regulations; a change in one or more of the organization's policies; and/or the new or changing data requirements of one or more high-value services being provisioned to users **102** based upon such collected activity data.

Referring to FIG. **4**, a sample activity data collection configuration table **400**, in one embodiment of the present invention, is shown. In such an embodiment, intranet **106** utilizes the SHAREPOINT® web platform available from Microsoft Corporation of Redmond, Wash. Thus, in such an embodiment, table **400** contains the following fields: "AdapterId"—the primary key in the table and may indicate which of the plurality of collector servers **114** the activity data collection rule (or "adapter") specified by the table entry is to execute upon; "Description"—a free text description for administrative purposes; "ConfigData"—a configuration string for specific adapter type (e.g., a domain name from which to collect active directory data (ID **1**), URL of a SharePoint site from which to collect metadata (ID **2**), URL of the site, and location of the IIS log files (ID **3** and ID **5**) and other data as applicable (ID **4**)); "AsemblyName"—the name of the computer executable code file which contains the actual implementation of the adapter; "IdleTime"—time (in seconds) between collections; "ImpersonateAccount"—alternative credentials to collect data where if it is not set, then the default credentials would be used; "DayOfWeek" and "HourOfDay"—the execution schedule (e.g., execute only during night hours or on weekends), and if it is not set, then collection is run continuously while giving effect to the "IdleTime" filed.

In an alternate embodiment, a configuration table may contain a list of "blacklisted" users and items (e.g., URLs) stored in an XML or other formatted file. In such an embodiment, "users" may include users **102** who opted-out of activity collection or even crawling robots executing within system **100** to make intranet **106** operational and thus such activity data is not useful for the provisioning of high-value services. Items, on the other hand, might be blacklisted for multiple reasons (e.g., privacy or a commonly-used API within intranet **106**).

In another embodiment, a configuration table may include rules for extracting specific patterns of usage (e.g., access to a specific productivity application or website). In such an embodiment, these rules may be implemented as series of accept/reject rules which are chained together. Such rules can simply be the (whole or partial) matching of URLs, or more sophisticated such as looking up the URL history of a user **102** so an actual pattern is triggered by more than one record in the web server log file. Further, there can be line of business (LOB)-specific information rules which search for application-specific patterns (e.g., searching for ISBN codes in the URLs of visited sites, thus making it possible to determine book-related activities by users **102**).

In yet another embodiment, a configuration table may include rules to exclude items which may present privacy concerns or might have a high business impact. For example, such a configuration table may be formatted as follows:

ItemId	URL	UriCheckSum
6864	http://sharepoint/SensitiveSubSite	−2123596221
6865	http://AnotherSensitiveSite	−1226526623

In such a configuration table, the "ItemId" field is a surrogate primary key, the "URL" field is the item's URL and the "UriCheckSum" filed is a checksum for fast searching. A similar table may be employed for users to be excluded from the activity data collection process (where a UserID would replace the URL field in the configuration table) based on engaging in an opt-out procedure, or checking a jurisdictional domain based on any applicable national and/or local privacy laws and regulations.

In one embodiment, the present invention (i.e., system **100**, process **200** or any components thereof) is directed toward one or more computer systems capable of carrying out the functionality described herein. An example of a computer system **300** is shown in FIG. **3**.

Computer system **300** includes one or more processors, such as processor **304**. The processor **304** is connected to a communication infrastructure **306** (e.g., a communications bus or network). Various software aspects are described in terms of this exemplary computer system. After reading this description, it will become apparent to a person skilled in the relevant art(s) how to implement the invention using other computer systems and/or architectures.

Computer system **300** can include a display interface **302** that forwards graphics, text and other data from the communication infrastructure **306** (or from a frame buffer not shown) for display on the display unit **330**.

Computer system **300** also includes a main memory **308**, preferably random access memory (RAM) and may also include a secondary memory **310**. The secondary memory **310** may include, for example, a hard disk drive **312** and/or a removable storage drive **314**, representing a floppy disk drive, a magnetic tape drive, an optical disk drive, etc. The removable storage drive **314** reads from and/or writes to a removable storage unit **318** in a well known manner. Removable storage unit **318** represents a floppy disk, magnetic tape, optical disk, etc. which is read by and written to by removable storage drive **314**. As will be appreciated, the removable storage unit **318** includes a computer usable storage medium having stored therein computer software and/or data.

In alternative aspects, secondary memory **310** may include other similar devices for allowing computer programs or other code or instructions to be loaded into computer system **300**. Such devices may include, for example, a removable storage unit **322** and an interface **320**. Examples of such may include a program cartridge and cartridge interface (such as that found in video game devices), a removable memory chip (such as an erasable programmable read only memory (EPROM), or programmable read only memory (PROM)) and associated socket and other removable storage units **322** and interfaces **320**, which allow software and data to be transferred from the removable storage unit **322** to computer system **300**.

Computer system **300** may also include a communications interface **324**. Communications interface **324** allows software and data to be transferred between computer system **300** and external devices. Examples of communications

interface **324** may include a modem, a network interface (such as an Ethernet card), a communications port, a Personal Computer Memory Card International Association (PCMCIA) slot and card, etc. Software and data transferred via communications interface **324** are in the form of non-transitory signals **328** which may be electronic, electromagnetic, optical or other signals capable of being received by communications interface **324**. These signals **328** are provided to communications interface **324** via a communications path (e.g., channel) **326**. This channel **326** carries signals **328** and may be implemented using wire or cable, fiber optics, a telephone line, a cellular link, an radio frequency (RF) link and other communications channels.

In this document, the terms "computer program medium" and "computer usable medium" are used to generally refer to media such as removable storage drive **314**, a hard disk installed in hard disk drive **312** and signals **328**. These computer program products provide software to computer system **300**. The invention is directed to such computer program products.

Computer programs (also referred to as computer control logic) are stored in main memory **308** and/or secondary memory **310**. Computer programs may also be received via communications interface **324**. Such computer programs, when executed, enable the computer system **300** to perform the features of the present invention, as discussed herein. In particular, the computer programs, when executed, enable the processor **304** to perform the features of the present invention. Accordingly, such computer programs represent controllers of the computer system **300**.

In an embodiment where the invention is implemented using software, the software may be stored in a computer program product and loaded into computer system **300** using removable storage drive **314**, hard drive **312** or communications interface **324**. The control logic (software), when executed by the processor **304**, causes the processor **304** to perform the functions of the invention as described herein.

In another embodiment, the invention is implemented primarily in hardware using, for example, hardware components such as application specific integrated circuits (ASICs). Implementation of the hardware state machine so as to perform the functions described herein will be apparent to persons skilled in the relevant art(s).

As will be apparent to one skilled in the relevant art(s) after reading the description herein, the computer architecture shown in FIG. **3** may be configured as a desktop, a laptop, a server, a tablet computer, a PDA, a mobile computer, an intelligent communications device or the like.

In yet another embodiment, the invention is implemented using a combination of both hardware and software.

While various aspects of the present invention have been described above, it should be understood that they have been presented by way of example and not limitation. It will be apparent to persons skilled in the relevant art(s) that various changes in form and detail can be made therein without departing from the spirit and scope of the present invention. Thus, the present invention should not be limited by any of the above described exemplary aspects, but should be defined only in accordance with the following claims and their equivalents.

In addition, it should be understood that the figures in the attachments, which highlight the structure, methodology, functionality and advantages of the present invention, are presented for example purposes only. The present invention is sufficiently flexible and configurable, such that it may be implemented in ways other than that shown in the accompanying figures. For example, the systems, methods and computer program products for facilitating the collection of intranet activity data while complying with applicable privacy laws and regulations and organizational policies disclosed herein are also applicable to other networks such as internets.

Further, the purpose of the foregoing Abstract is to enable the U.S. Patent and Trademark Office and the public generally and especially the scientists, engineers and practitioners in the relevant art(s) who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of this technical disclosure. The Abstract is not intended to be limiting as to the scope of the present invention in any way.

What is claimed is:

1. A system for collection of activity data related to a plurality of authenticated computer network users, comprising:

a data collection server, deployed within said computer network, configured to collect raw activity data related to said plurality of users from sources within said computer network, wherein said sources include at least some of a web content management server, a document management server, a web server, a proxy server, a directory service information server, an email server, or a client-side logging application, the data collection server being configured to normalize the raw activity data to provide normalized activity data associated with the document, wherein normalization of the raw activity data resolves differences of actions on the document by unifying saving the document, directly opening the document, and opening the document via textually different URLs such that the activity data reflects activity data associated with the document, wherein the textually different URLs are resolved to be logically equivalent by disassembling the textually different URLs and reconstructing a URL having a unified format; and

a control server coupled to said data collection server, said control server having a processor and a memory storing at least one configuration table containing at least one rule based on which said control server is configured to regulate the collection, transformation, aggregation, and anonymization of said raw activity data related to said plurality of users to generate user activity data on said computer network in compliance with at least one privacy law and/or at least one organizational privacy policy, wherein personally identifiable information is removed from the user activity data, wherein said at least one rule includes a schedule to collect activity data from said sources and an exclusion rule which defines a subset of said plurality of users and/or sources from which collection of activity data is not allowed.

2. The system of claim **1**, wherein said at least one rule contained in said at least one configuration table is one of: an access rule; an aggregation rule; a transformation rule; an exclusion rule; and a consent rule.

3. The system of claim **1**, further comprising:

means for providing a graphical user interface to allow the editing of said at least one configuration table in order to comply with at least one of: a change in the at least one privacy law; and the at least one organizational privacy policy.

4. The system of claim **1**, further comprising means for providing at least one of: augmenting documents with extra information; improving search results; automatic news

feeds; and social networking announcements to said plurality of users based on said user activity data stored in said database.

5. The system of claim 1, wherein said activity data is data related to one of the plurality of users and results from said one of the plurality of users: navigating to a URL; opening a document; editing a document; writing an email; opening an email; reading an email; sending an instant message; and receiving an instant message.

6. A computer-implemented method for collecting activity data related to a plurality of authenticated computer network users, said method comprising:

collecting, by a processor, raw activity data related to said plurality of users from sources within said computer network, wherein said sources include at least some of a web content management server, a document management server, a web server, a proxy server, a directory service information server, an email server, or a client-side logging application;

regulating, by a processor, collection, transformation, aggregation, and anonymization of said raw activity data related to said plurality of users from said sources based on at least one rule in a configuration table to generate user activity data on said computer network in compliance with at least one privacy law and/or at least one organizational privacy policy, wherein personally identifiable information is removed from said user activity data, wherein said at least one rule includes an exclusion rule that defines a subset of said plurality of users from whom collection of activity data is not allowed, said subset of said plurality of users being from a particular geographical location or a group within an organization;

normalizing, by a processor, the raw activity data to provide normalized activity data associated with the document, wherein normalizing the raw activity data resolves differences of actions on the document by unifying saving the document, directly opening the document, and opening the document via textually different URLs such that the activity data reflects activity data associated with the document, wherein the textually different URLs are resolved to be logically equivalent by disassembling the textually different URLs and reconstructing a URL having a unified format; and

storing, by a processor, said user activity data in a database.

7. The computer-implemented method of claim 6, wherein said at least one rule contained in said at least one configuration table is one of: an access rule; an aggregation rule; a transformation rule; an exclusion rule; and a consent rule.

8. The computer-implemented method of claim 6, wherein said at least one rule includes an exclusion rule which defines a subset of said plurality of users from whom collection of activity data is not allowed, said subset of said plurality of users being from a particular geographical location.

9. The computer-implemented method of claim 6, further comprising

receiving an edit, via a graphical user interface, of said at least one configuration table in order to comply with at least one of: a change in the at least one privacy law; and the at least one organizational privacy policy.

10. The computer-implemented method of claim 6, wherein said activity data is data related to one of the plurality of users and results from said one of the plurality of users: navigating to a URL; opening a document; editing a document; writing an email; opening an email; reading an email; sending an instant message; and receiving an instant message.

11. The computer-implemented method of claim 6, wherein said at least one rule specifies a pre-determined schedule to collect activity data from said at least one source.

12. A computer-implemented method for collecting activity data related to a plurality of authenticated computer network users, said method comprising:

collecting, by a processor, raw activity data of said plurality of users from sources within said computer network, wherein said sources include at least some of a web content management server, a document management server, a web server, a proxy server, a directory service information server, an email server, or a client-side logging application, and wherein said activity data include data corresponding to at least one of navigating to a URL, opening a document, editing a document, writing an email, opening an email, reading an email, sending an instant message, or receiving an instant message;

generating, by a processor, user activity data in compliance with at least one privacy law and/or at least one organizational privacy policy via transformation, aggregation, and anonymization of said raw activity data based on at least one rule in a configuration table such that personally identifiable information is removed from the user activity data, wherein said at least one rule includes an access rule, an aggregation rule, a transformation rule, an exclusion rule, or a consent rule, wherein the exclusion rule defines

a subset of said plurality of users from whom collection of activity data is not allowed, said subset of said plurality of users being from a particular geographical location or a group within an organization;

normalizing, by a processor, the raw activity data to provide normalized activity data associated with the document, wherein normalizing the raw activity data resolves differences of actions on the document by unifying saving the document, directly opening the document, and opening the document via textually different URLs such that the activity data reflects activity data associated with the document, wherein the textually different URLs are resolved to be logically equivalent by disassembling the textually different URLs and reconstructing a URL having a unified format; and

storing, by a processor, said user activity data in a database.

13. The computer-implemented method of claim 12, wherein said at least one rule includes an exclusion rule which defines that at least one of a web content management server, a document management server, a web server, a proxy server, a directory service information server, an email server, or a client-side logging application from which collection of activity data is not allowed.

14. The computer-implemented method of claim 12, wherein said at least one rule includes a consent rule that provides notice of data collection to said users and allows said users to choose whether to participate.

15. The computer-implemented method of claim 12, wherein collecting raw activity data includes receiving said raw activity data from a client-side logging application executing on a computing device associated with one of said plurality of users.

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